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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,395	02/23/2004	Walter D. Mieher	KLA1P117X1B/P1151/3	6514
22434	7590	09/06/2006	EXAMINER	
BEYER WEAVER & THOMAS, LLP			STOCK JR, GORDON J	
P.O. BOX 70250			ART UNIT	
OAKLAND, CA 94612-0250			PAPER NUMBER	

2877

DATE MAILED: 09/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/785,395

Applicant(s)

MIEHER ET AL.

Examiner

Gordon J. Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20050516;20041108;20040816</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on May 26, 2005; November 8, 2004; and August 16, 2004 are being considered by the examiner.

Drawings and Specification

2. The specification is objected to for the following: on page 42 line 7 'modulation device 532' should read –modulation device 552-; on page 43 line 9 'mirror 574' should read –mirror 572-; on page 74 lines 4 and 6 'targets 1008' should read –targets 1008a-1008d-; on page 79 line 10 '152' should read -1152-; on page 82 line 7 the U.S. Provisional Application No. needs to be updated; on page 85 lines 8 and 13 '116' should read –1166-. Corrections required.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **T2** of Fig. 2a..
Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
4. The drawings and specification are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the

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description: **OVL** of Fig. 3b; **502, 503, 504, 505, 506, 508, 509, 510, 512, 514**, and **524** of Fig. 5a; **704** of Fig. 7; **1184** and **1188** of Fig. 11f. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. **Claims 1-14** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In **claim 1** the step of determining overlay error using a scatterometry technique is an abstraction without a tangible result. **Claims 2-14** are rejected for depending upon a rejected base claim; wherein **claims 2-14** further limiting of the parent claim still does not have a tangible result. Merely 'determining overlay error' would not appear to be

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sufficient to constitute a tangible result, since the outcome of the ‘determining’ has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. See OG Notices: 22 November 2005, "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility".

Specifically: Part b. *Practical Application the Produces a Useful, Concrete, and Tangible Result* under Section IV *Determine Whether the Claimed Invention Complies with the Subject Matter Eligibility Requirement of 35 U.S.C. Sec. 101*, sentence 3, in the OG Notice from 22 November 2005 states ‘In determining whether the claim is for a “practical application,” the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather that the final result achieved by the claimed invention is “useful, tangible, and concrete.”’

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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9. **Claims 1, 5, 6, 12-13** are rejected under 35 U.S.C. 102(e) as being anticipated by **Sezginer et al. (2005/0122516)**.

As for **claim 1**, Sezginer in an overlay metrology method discloses the following: for each of a plurality of periodic targets that each have a first structure formed from a first layer and a second structure formed from a second layer of the sample (Figs. 6a, 6b; 7a); measuring a plurality of optical signals at a plurality of incident angles (paragraph 0059: measurements as a function of incident angle); wherein there are predefined offsets between the first and second structures (paragraph 0048); determining an overlay error between the first and second structures by analyzing the measured signals at the plurality of incident angles from the periodic targets (paragraph 0059) using a scatterometry technique (paragraph 0029) based on the predefined offsets (paragraphs 0026-0028) without using a calibration operation (paragraphs 0060-0063).

As for **claim 5**, Sezginer discloses everything as above (see **claim 1**). In addition, he discloses comparing the measured optical signals to theoretical data to thereby obtain parameters of the periodic targets (paragraphs 0060-0061).

As for **claim 6**, Sezginer discloses everything as above (see **claim 1**). In addition, he discloses comparing the measured optical signals to theoretical data to thereby adjust the model used to generate the theoretical data (paragraphs 0060-0061).

As for **claim 12**, Sezginer discloses everything as above (see **claim 1**). In addition, he discloses the overlay error is determined without comparing the measured optical signals to calibration data (paragraphs 0060-0063).

As for **claim 13**, Sezginer discloses everything as above (see **claim 1**). In addition, he discloses a linear based technique (paragraph 0016).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sezginer et al. (2005/0122516)** in view of **Niu et al. (6,699,624)**.

As for **claim 14**, Sezginer discloses everything as above (see claim 1). He does not explicitly state a phase based technique; he does disclose ellipsometry (paragraph 0059). However, Niu in an overlay metrology method teaches using phase in ellipsometry (col. 4, lines 65-67). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to use a phase-based technique such as ellipsometry in order to measure the profile of the gratings for overlay calculation.

Allowable Subject Matter

12. **Claims 2-4, 7-11** would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and rewritten to overcome the rejection under 35 U.S.C. 101 stated above.

As to **claim 2**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method of determining an overlay error simultaneous obtainment of the plurality of measured optical signals for each target, in combination with the rest of the limitations of **claims 2-4, 7-10**.

As to **claim 11**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method of determining an overlay error wherein the centers of symmetry are offset, in combination with the rest of the limitations of **claim 11**.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (571) 273-8300

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

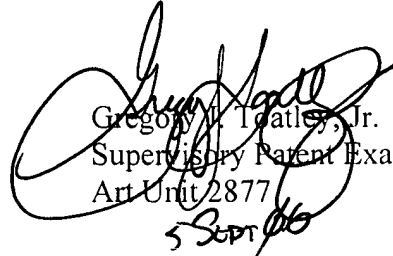
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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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September 1, 2006



Gregory M. Teatle, Jr.
Supervisory Patent Examiner
Art Unit 2877
5 Sept 06